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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/405,934	09/27/99	JORGENSEN	P 5509-00100

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EXAMINER	
PREISCH, N	
ART UNIT	**PAPER NUMBER**
1764	12

DATE MAILED: 08/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/405,934	Applicant(s) JORGENSEN, PIERRE	
	Examiner Nadine Preisch	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Removal of Claim Objections

Applicant's amendment submitted 6-1-01 is sufficient to overcome the claim objection of claim 4.

Claim Rejections - 35 USC § 112

Applicant's amendment submitted 6-1-01 is sufficient to overcome 112 rejection of claim 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4, 8, 9, 11, 12, 13, 16, 17, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the oral translation of German Patent (1,049,851) in view of Hsu et al.(4,692,237) and Bunas et al.(3,998,726).

Applicant is claiming a process for converting hydrocarbons which might be laden impurities to light products that may be distilled. Applicant claims the process involves preheating a hydrocarbon load; treating the hydrocarbon load with a jet having a first amount of energy which causes the load to reach an activation energy at which a portion of the molecules split into lighter molecules; stabilizing the load in a reactor at a first pressure; expanding the

load at a second pressure; and passing the load through a series of extractors configured to demetallize the load, wherein at least one reactor produces a water/hydrocarbon emulsion.

German Patent (1,049,851) discloses a process for the production of light hydrocarbons by thermal cracking with a heat transfer gas. The process involves the formation of a heated gas and a hydrocarbon mixture. The heated mixture is passed to a reactor. The mixture is vaporized in a chamber. See page 2, column 1, lines 55-67 and page 2, column 2, lines 1-10.

The reference of German Patent (1,049,851) succeeds in disclosing a hydrocarbon cracking process which involves the heating of a hydrocarbon and the addition of a heat transfer gas to the feed which is passed to a reactor. The disclosure of cracking encompasses applicant's splitting limitations. The reference's heat transfer gas is considered to correspond to applicant's jet containing energy. In addition, the reference's vaporization of the gas/feed mixture is considered to correspond to applicant's expanding of a load at a second pressure because the gas/feed mixture is converted to a vapor which is less dense. The reference's disclosure of the production of lighter molecules is considered to encompass applicant's breaking of substantially all the molecules into two parts because the lighter products are all portions of heavier molecules.

The pressure of the gas/liquid mixture before it is expanded (i.e. vaporized) is considered to meet applicant's limitation in claim 12 wherein the pressure is selected to minimize soaking. Since the reference does not disclose the formation of coke, it appears that soaking in limited.

Several differences are noted between German Patent (1,049,851) and applicant's invention. The reference is silent about extracting the products to remove metals. In addition, the reference is silent about an emulsification step.

The reference of Bunas et al.(3,998,726) is cited to illustrate that the removal of metal contaminants from a hydrocarbon stock by solvent extraction is known in the art. See abstract, lines 1-5. The extraction is performed at a temperature of 50-600°F (10-316°). See column 6, lines 64-66.

The reference of Hsu et al.(4,692,237) is cited to illustrate that it is known in the art to utilize the formation of water/oil emulsions for the removal of undesirable inorganic solids in fractions obtained from steam cracking units. See abstract, lines 1-8.

Applicant's metallic extraction steps do not distinguish over the reference of German Patent (1,049,851) because extraction to remove undesirable metallic components is known in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made practicing the invention of German Patent (1,049,851) to remove any undesirable metal components which may be present in the final product by extraction because the reference of Bunas et al.(3,998,726) illustrates that it is known in the art to extract undesirable metallic components from hydrocarbon stocks. In addition, it would have been obvious to one o ordinary skill in the art at the time the invention was made to select applicant's extraction temperatures because such temperatures are sufficiently close to those disclosed by the reference of Bunas et al.(3,988,726) that a similar extraction would be expected.

Applicant's emulsion forming step is not considered to be a patentable distinction over the reference of German Patent (1,049,861) because the removal of undesirable components from steam cracking products from emulsion formation is known. It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate an undesirable inorganic component (metal = inorganic component) from a cracked product by emulsion

formation, because the reference of Hsu et al.(4,629,237) illustrates that it is known in the art to separate undesirable inorganic components from cracked products by emulsion formation.

Claim Rejections - 35 USC § 103

Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent (1,049,851) in view of Hsu et al.(4,692,237) and Bunas et al.(3,998,726) as applied to claims 1, 2, 4, 8, 9, 11, 12, 13, 16, 17, 18 and 19 above, and further in view of Kruyer (4,406,793).

A difference is noted between the combined teachings of German Patent (1,049,851), Hsu et al.(4,692,237) and Bunas et al.(3,998,726). The combined teachings do not disclose the breaking up the emulsions with a screen.

The reference of Kruyer (4,406,793) is cited to illustrate that oil in water emulsions are broken by passing the emulsion through a mesh fiber or wire. See column 3, lines 23-35 and column 4, lines 63-67. The mesh fiber/wire is considered to correspond to applicant's "screen" structure.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to break the emulsion formed by the combined teachings of German Patent (1,049,851), Hsu et al.(4,692,237) and Bunas et al.(3,998,726) with a screen because Kruyer (4,406,793) illustrates that mesh structures (screen) are known to break oil/water emulsions.

Claim Rejections - 35 USC § 103

Claims 5-7, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent (1,049,851) in view of Hsu et al.(4,692,237) and Bunas et al.(3,998,726) as applied to claim 1, 2, 4, 8, 9, 11, 12, 13, 16, 17, 18 and 19 above, and further in view of Watson (1,811,195).

A difference is noted between the combined teachings of German Patent (1,049,851), Hass et al.(4,692,237) and Bunas et al.(3,998,726). The references are silent about the use of steam as a heat transfer gas.

The reference of Watson (1,811,195) is cited to illustrate that steam is a known heat transfer gas for use in thermal cracking. See page 1, column 1, lines 14-30.

Since the reference of German Patent (1,049,851) does not limit the type of gas injected into the feed, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select steam as the gas injected into the feed because the reference of Watson (1,811,195) illustrates that steam is known to accomplish cracking with the formation of lighter components.

Claim Rejections - 35 USC § 103

Claim 10 stands rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent (1,049,851) in view of Hsu et al.(4,692,237) and Bunas et al.(3,998,726) as applied to claims 1, 2, 4, 8, 9, 11, 12, 13, 16, 17, 18, and 19 above, and further in view of in further view of Dubbs (1,935,148).

A difference is noted between the combined teachings of German Patent (1,049,851), Hsu et al.(4,692,237) and Bunas et al.(3,998,726) and applicant's claimed invention. The reference is silent about the load being a finely pulverized solid.

The reference of Dubbs (1,935,148) is cited to illustrate that powdered coal (powdered coal = pulverized solid) is a suitable thermal cracking feed. See page 1, lines 1-5 and page 1, column 2, lines 85-59.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select a pulverized solid in the form of powdered coal as a feed to produce lighter products in the reference of Dubbs (1,935,148) because the reference teaches that powdered coal is a suitable feed in a cracking process to produce lighter products.

Response to Arguments

Applicant's arguments filed 6-1-01 have been fully considered but they are not persuasive.

Applicant's argument that the reference's heat transfer gas does not correspond to applicant's jet containing energy because the jet imparts not only thermal energy but also mechanical energy is not persuasive in overcoming the rejection. The translation of DE (1,049,851) illustrates that the heat transfer medium is introduced at a high speed through a nozzle (p.1, lines 10-11). The position is taken that the disclosure of a high-speed injection through a nozzle corresponds to applicant's jet. Furthermore, the translation also illustrates that the heat transfer medium also imparts "mechanical" energy (p.2, lines 19-20).

Applicant's argument that it is well known that both a vaporized portion of a load and an unvaporized portion of a load can be present at the same pressure is not persuasive in distinguishing applicant's invention over the reference of German Patent (1,049,851). In response, it is maintained that applicant's statement is true depending on specific temperature and volume parameters. In this specific case, it appears that the feed is heated with the heat transfer medium prior to entering the vaporization chamber. The feed is vaporized because it expands in the vaporization chamber. Such an expansion is due to a decrease in pressure resulting from an increase in volume.

Applicant's argument that the reference does not suggest the minimization of soaking is not persuasive in overcoming the rejection. In response, it is maintained that since no coke has formed, the conditions minimize the formation of coke. Furthermore, the English translation of German Patent (1,049,851) states that the disclosed process reduces the formation of elemental carbon (p.3, lines 6-9). Elemental carbon forms during soaking.

In response to applicant's arguments with respect to the combination of references, the secondary references were cited to illustrate that the deficiencies of the primary reference were conventional in the art. For instance, applicant has not shown anything unexpected by combining two previously known processes represented by thermal cracking of German Patent (1,049,851) and the extraction/emulsification of Bunas et al.(3,998,726) and Hsu et al.(4,692,237). It has been held that a process is not patentable where it is an obvious combination of two processing steps, wherein each process step lends to end products the desirable properties that each is known to produce when practiced alone and there exists no

evidence of co-action between the steps that produces unexpected results. In re Fortess and Schoenebeg, 152 USPQ 13 (CCPA 1966).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Prior Art of Record

See attached full English translation of German Patent 1,049,851.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Preisch whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode can be reached on 703-308-4311. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-5408 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

N.P.
August 12, 2001

NP

NADINE PREISCH
ART UNIT 1764